

## CLAIMS

What is claimed is:

1. An improved gasket for sealing between longitudinally opposed mating surfaces of at least a pair of members adapted to be forcibly mated together to clamp said gasket therebetween, the mating surfaces having openings therein laterally aligned in longitudinal communication with each other when the members are mated together, said gasket comprising:

a relatively rigid carrier having first and second laterally-extending sides defining a longitudinal thickness therebetween, said carrier having a gasket opening therethrough adapted to be laterally aligned in longitudinal communication with the openings in the mating surfaces of the members when said gasket is clamped between the mated members;

a resilient sealing material substantially more flexible than said carrier and being disposed on at least portions of said laterally-extending sides of said carrier for sealingly engaging the mating surfaces of the members adjacent the openings therein when said gasket is clamped between the mated members;

a longitudinally flexible inner sealing portion of said carrier disposed laterally adjacent said gasket opening, said inner sealing portion being longitudinally offset relative to the remainder of the carrier, said inner sealing portion being offset in a longitudinal direction toward a first of the members when said gasket is clamped between the mated members, said inner sealing portion having said resilient sealing material disposed on at least portions of its laterally-extending sides for sealing engagement with

the mating surfaces of the members when said gasket is clamped between the mated members; and

a longitudinally flexible outer stopper portion of said carrier spaced laterally away from said gasket opening and disposed laterally outward relative to said inner sealing portion, said flexible stopper portion being longitudinally convex relative to the remainder of said carrier on a side of said flexible stopper oriented toward said first of the members and being longitudinally concave relative to the remainder of said carrier on an opposite side of said flexible stopper oriented toward a second of the members, said flexible stopper flexibly limiting the amount of longitudinal compression of said inner sealing portion and being less flexible than said inner sealing portion, said inner sealing portion being thereby maintained in said sealing engagement with the mating surfaces of both of the members during relative movement between the members when the members are mated together.

2. The gasket of claim 1, wherein said inner sealing portion is longitudinally offset to an extent greater than the extent of longitudinal convexity of the flexible stopper portion.

3. The gasket of claim 1, wherein said inner sealing portion has a lateral dimension greater than the lateral dimension of said flexible stopper.

4. The gasket of claim 1, wherein said flexible stopper member has said resilient sealing material disposed within and at least partially filling its concave side toward said second of the members when said gasket is clamped between the mated members.

5. The gasket of claim 1, wherein said flexible stopper has said resilient sealing material disposed on at least portions of its laterally-extending sides for sealing engagement with the mating surfaces of the members when said gasket is clamped between the mated members.

6. The gasket of claim 1, wherein said flexible stopper member has an additional amount of said resilient sealing material disposed within and at least partially filling its concave side toward said second of the members.

7. The gasket of claim 1, wherein said relatively rigid carrier is a single layer carrier.

8. The gasket of claim 1, wherein said carrier is formed of a metal-containing material.

9. The gasket of claim 1, wherein said carrier is formed of a steel-containing material.

10. The gasket of claim 1, wherein said carrier is formed of a synthetic-containing material.

11. The gasket of claim 1, wherein said resilient sealing material is a rubber-containing material.

12. The gasket of claim 1, wherein said resilient sealing material is an elastomer-containing material.

13. The gasket of claim 1, wherein said resilient sealing material covers substantially all of said laterally-extending sides of said carrier.

14. The gasket of claim 1; wherein said resilient sealing material is adjacent at least portions of said carrier.

15. The gasket of claim 1, wherein said resilient sealing material is screen-printed onto at least portions of said carrier.

16. The gasket of claim 1, wherein said gasket is adapted to be clamped between a cylinder head and a cylinder block of an internal combustion engine.

17. The gasket of claim 1, wherein said gasket is adapted to be clamped between a cylinder head and a cylinder block of a gas compressor.

18. The gasket of claim 1, wherein said gasket is adapted to be clamped between mated flanges of a gaseous fluid-conveying device.

19. The gasket of claim 1, wherein said gasket is adapted to be clamped between mated flanges of a liquid fluid-conveying device.

20. The gasket of claim 1, wherein said gasket is adapted to be clamped between mated pipe flanges.

21. The gasket of claim 1, wherein said gasket is adapted to be clamped between mated manifold flanges.

22. The gasket of claim 1, wherein said gasket is adapted to be clamped between mating surfaces of members defining an interior of an enclosure for sealingly isolating said enclosure interior from an exterior of said enclosure.

23. The gasket of claim 1, wherein said gasket is adapted to be clamped between mating surfaces of members that are releasably mated together.

24. The gasket of claim 1, wherein said gasket is adapted to be clamped between mating surfaces of members that are intermittently mated together.

25. The gasket of claim 1, wherein at least portions of said carrier are separated but interconnected by a portion of said resilient sealing material.

26. The gasket of claim 1, wherein the mating members are components of a fuel cell.

27. An improved cylinder head gasket for an internal combustion engine having a cylinder head and a cylinder block, said gasket adapted for sealing between longitudinally opposed mating surfaces of the head and the block which are adapted to be forcibly mated together to clamp said gasket therebetween, the mating surfaces having openings therein laterally aligned in longitudinal communication with each other when the head and the block are mated together, said gasket comprising:

a relatively rigid metallic carrier having first and second laterally-extending sides defining a longitudinal thickness therebetween, said carrier having a gasket opening therethrough adapted to be laterally aligned in longitudinal

communication with the openings in the mating surfaces of the head and the block when said gasket is clamped between the mated head and block;

a resilient sealing material substantially more flexible than said carrier and being disposed on at least portions of said laterally-extending sides of said carrier for sealingly engaging the mating surfaces of the head and the block adjacent the openings therein when said gasket is clamped between the mated head and block;

a longitudinally flexible inner sealing portion of said carrier disposed laterally adjacent said gasket opening, said inner sealing portion being longitudinally offset relative to the remainder of said carrier portion, said inner sealing portion being offset in a longitudinal direction toward a first of the head and the block when said gasket is clamped between the mated head and block, said inner sealing portion having said resilient sealing material disposed on at least portions of its laterally-extending sides for sealing engagement with the mating surfaces of the head and the block when said gasket is clamped between the mated head and block; and

a longitudinally flexible outer stopper portion of said carrier spaced laterally away from said gasket opening and disposed laterally outward relative to said inner sealing portion, said flexible stopper portion being longitudinally convex relative to the remainder of said carrier portion on a side of said flexible stopper oriented toward said first of the head and the block and being longitudinally concave relative to the remainder of said carrier portion on an opposite side of said flexible stopper oriented toward a second of the head and the block, said flexible stopper member having said resilient sealing material disposed within and at least partially filling its concave side toward said second of the head and the block when said gasket is clamped between the

mated head and block, said flexible stopper flexibly limiting the amount of longitudinal compression of said inner sealing portion and being less flexible than said inner sealing portion, said inner sealing portion being thereby maintained in said sealing engagement with the mating surfaces of both of the head and the block during relative movement between the head and the block when the head and the block are mated together.

28. The gasket of claim 27, wherein said inner sealing portion is longitudinally offset to an extent greater than the extent of longitudinal convexity of the flexible stopper portion.

29. The gasket of claim 27, wherein said inner sealing portion has a lateral dimension greater than the lateral dimension of said flexible stopper.

30. The gasket of claim 27, wherein said flexible stopper has said resilient sealing material disposed on at least portions of its laterally-extending sides for sealing engagement with the mating surfaces of the head and the block when said gasket is clamped between the mated head and block.

31. The gasket of claim 27, wherein said relatively rigid carrier is a single layer carrier.

32. The gasket of claim 27, wherein said carrier is formed of a steel-containing material.

33. The gasket of claim 27, wherein said resilient sealing material is a rubber-containing material.

34. The gasket of claim 27, wherein said resilient sealing material is an elastomer-containing material.

35. The gasket of claim 27, wherein said resilient sealing material covers substantially all of said laterally-extending sides of said carrier.

36. The gasket of claim 27, wherein said resilient sealing material covers at least portions of said carrier.

37. The gasket of claim 27, wherein said resilient sealing material is screen-printed onto at least portions of said carrier.

38. The gasket of claim 27, wherein at least portions of said carrier are separated but interconnected by a portion of said resilient sealing material.

39. An improved intake manifold gasket for an internal combustion engine having a cylinder head and an intake manifold, said gasket adapted for sealing between longitudinally opposed mating surfaces of the head and the manifold which are adapted to be forcibly mated together to clamp said gasket therebetween, the mating surfaces having openings therein laterally aligned in longitudinal communication with each other when the head and the manifold are mated together, said gasket comprising:

a relatively rigid metallic carrier having first and second laterally-extending sides defining a longitudinal thickness therebetween, said carrier having a gasket opening therethrough adapted to be laterally aligned in longitudinal communication with the openings in the mating surfaces of the head and the manifold when said gasket is clamped between the mated head and manifold;



a resilient sealing material substantially more flexible than said carrier and being disposed on at least portions of said laterally-extending sides of said carrier for sealingly engaging the mating surfaces of the head and the manifold adjacent the openings therein when said gasket is clamped between the mated head and manifold;

a longitudinally flexible inner sealing portion of said carrier disposed laterally adjacent said gasket opening, said inner sealing portion being longitudinally offset relative to the remainder of said carrier, said inner sealing portion being offset in a longitudinal direction toward a first of the head and the manifold when said gasket is clamped between the mated head and manifold, said inner sealing portion having said resilient sealing material disposed on at least portions of its laterally-extending sides for sealing engagement with the mating surfaces of the head and the manifold when said gasket is clamped between the mated head and manifold; and

a longitudinally flexible outer stopper portion of said carrier spaced laterally away from said gasket opening and disposed laterally outward relative to said inner sealing portion, said flexible stopper portion being longitudinally convex relative to the remainder of said carrier portion on a side of said flexible stopper oriented toward said first of the head and the manifold and being longitudinally concave relative to said carrier portion on an opposite side of said flexible stopper oriented toward a second of the head and the manifold, said flexible stopper flexibly limiting the amount of longitudinal compression of said inner sealing portion and being less flexible than said inner sealing portion, said inner sealing portion being thereby maintained in said sealing engagement with the mating surfaces of both of the head and the manifold during relative movement between the head and the manifold when the head and the manifold are mated together.

40. The gasket of claim 39, wherein said inner sealing portion is longitudinally offset to an extent greater than the extent of longitudinal convexity of the flexible stopper portion.

41. The gasket of claim 39, wherein said inner sealing portion has a lateral dimension greater than the lateral dimension of said flexible stopper.

42. The gasket of claim 39, wherein said flexible stopper member has said resilient sealing material disposed within and at least partially filling its concave side toward said second of the head and the manifold when said gasket is clamped between the mated head and manifold.

43. The gasket of claim 39, wherein said flexible stopper has said resilient sealing material disposed on at least portions of its laterally-extending sides for sealing engagement with the mating surfaces of the head and the manifold when said gasket is clamped between the mated head and manifold.

44. The gasket of claim 39, wherein said flexible stopper member has an additional amount of said resilient sealing material disposed within and at least partially filling its concave side toward said second of the head and the manifold.

45. The gasket of claim 39, wherein said relatively rigid carrier is a single layer carrier.

46. The gasket of claim 39, wherein said carrier is formed of a steel-containing material.

47. The gasket of claim 39, wherein said resilient sealing material is a rubber-containing material.

48. The gasket of claim 39, wherein said resilient sealing material is an elastomer-containing material.

49. The gasket of claim 39, wherein said resilient sealing material covers substantially all of said laterally-extending sides of said carrier.

50. The gasket of claim 39, wherein said resilient sealing material covers at least portions of said carrier.

51. The gasket of claim 39, wherein said resilient sealing material is screen-printed onto at least portions of said carrier.

52. The gasket of claim 39, wherein at least portions of said carrier are separated but interconnected by a portion of said resilient sealing material.

53. An improved exhaust manifold gasket for an internal combustion engine having a cylinder head and an exhaust manifold, said gasket adapted for sealing between longitudinally opposed mating surfaces of the head and the manifold which are adapted to be forcibly mated together to clamp said gasket therebetween, the mating surfaces having openings therein laterally aligned in longitudinal communication with each other when the head and the manifold are mated together, said gasket comprising:

a relatively rigid metallic carrier having first and second laterally-extending sides defining a longitudinal thickness therebetween, said carrier having a gasket opening therethrough adapted to be laterally aligned in longitudinal communication with the openings in the mating surfaces of the head and the manifold when said gasket is clamped between the mated head and manifold;

a resilient sealing material substantially more flexible than said carrier and being disposed on at least portions of said laterally-extending sides of said carrier for sealingly engaging the mating surfaces of the head and the manifold adjacent the openings therein when said gasket is clamped between the mated head and manifold;

a longitudinally flexible inner sealing portion of said carrier disposed laterally adjacent said gasket opening, said inner sealing portion being longitudinally offset relative to the remainder of said carrier, said inner sealing portion being offset in a longitudinal direction toward a first of the head and the manifold when said gasket is clamped between the mated head and manifold, said inner sealing portion having said resilient sealing material disposed on at least portions of its laterally-extending sides for sealing engagement with the mating surfaces of the head and the manifold when said gasket is clamped between the mated head and manifold; and

a longitudinally flexible outer stopper portion of said carrier spaced laterally away from said gasket opening and disposed laterally outward relative to said inner sealing portion, said flexible stopper portion being longitudinally convex relative to the remainder of said carrier portion on a side of said flexible stopper oriented toward said first of the head and the manifold and being longitudinally concave relative to the remainder of said carrier portion on an opposite side of said flexible stopper oriented toward a second of the head and the manifold, said flexible stopper flexibly limiting the amount of longitudinal compression of said inner sealing portion and being less flexible than said inner sealing portion, said inner sealing portion being thereby maintained in said sealing engagement with the mating surfaces of both of the head and the manifold during relative movement between the head and the manifold when the head and the manifold are mated together.

54. The gasket of claim 53, wherein said inner sealing portion is longitudinally offset to an extent greater than the extent of longitudinal convexity of the flexible stopper portion.

55. The gasket of claim 53, wherein said inner sealing portion has a lateral dimension greater than the lateral dimension of said flexible stopper.

56. The gasket of claim 53, wherein said flexible stopper member has said resilient sealing material disposed within and at least partially filling its concave side toward said second of the head and the manifold when said gasket is clamped between the mated head and manifold.

57. The gasket of claim 53, wherein said flexible stopper has said resilient sealing material disposed on at least portions of its laterally-extending sides for sealing engagement with the mating surfaces of the head and the manifold when said gasket is clamped between the mated head and manifold.

58. The gasket of claim 53, wherein said flexible stopper member has an additional amount of said resilient sealing material disposed within and at least partially filling its concave side toward said second of the head and the manifold.

59. The gasket of claim 53, wherein said relatively rigid carrier is a single layer carrier.

60. The gasket of claim 53, wherein said carrier is formed of a steel-containing material.

61. The gasket of claim 53, wherein said resilient sealing material is a rubber-containing material.

62. The gasket of claim 53, wherein said resilient sealing material is an elastomer-containing material.

63. The gasket of claim 53, wherein said resilient sealing material covers substantially all of said laterally-extending sides of said carrier.

64. The gasket of claim 53, wherein said resilient sealing material covers at least portions of said carrier.

65. The gasket of claim 53, wherein said resilient sealing material is screen-printed onto at least portions of said carrier.

66. The gasket of claim 53, wherein at least portions of said carrier are separated but interconnected by a portion of said resilient sealing material.